same, is also $\frac{40!}{36!.4!}=\frac{40.39.38.37}{1.2.3.4}$.

The number of committees in which the chairman is selected, leaving 39 from whom to choose, is $\frac{39!}{36!.3!}=\frac{39.38.37}{6}=9139$.

Also solved by *G. B. M. ZERR.*

151. Proposed by JOHN M. COLAW, A. M., Monterey, Va.

Solve the equations:

$$x+y+z+u+w=1.$$
$$ax+by+cz+du+ew=h,$$
$$a^2x+b^2y+c^2z+d^2u+e^2w=h^2,$$
$$a^3x+b^3y+c^3z+d^3u+e^3w=h^3,$$
$$a^4x+b^4y+c^4z+d^4u+e^4w=h^4.$$

Solution by CLARENCE E. COMSTOCK, Professor of Mathematics. Bradley Polytechnic Institute. Peoria.Ill.

Solution by determinants.

$$x=\begin{vmatrix} 1 & 1 & 1 & 1 & 1 \\ h & b & c & d & e \\ h^2 & b^2 & c^2 & d^2 & e^2 \\ h^3 & b^3 & c^3 & d^3 & e^3 \\ h^4 & b^4 & c^4 & d^4 & e^4 \end{vmatrix} \div \begin{vmatrix} 1 & 1 & 1 & 1 & 1 \\ a & b & c & d & e \\ a^2 & b^2 & c^2 & d^2 & e^2 \\ a^3 & b^3 & c^3 & d^3 & e^3 \\ a^4 & b^4 & c^4 & d^4 & e^4 \end{vmatrix} \equiv \frac{\Delta_{a=b}}{\Delta}.$$

By the factor theorem, we get

$$\Delta=(a-b)(a-c)(a-d)(a-e)(b-c)(b-d)(b-e)(c-d)(c-e)(d-e).$$

$\Delta_{a=h}$=the same with a replaced by h.

$$\therefore x=\frac{(h-b)(h-c)(h-d)(h-e)}{(a-b)(a-c)(a-d)(a-e)}.$$

Since a, b, c, d, e appear in the same way, the principle of symmetry enables us to write the values y, z, u, w at once.

$$y=\frac{(h-a)(h-c)(h-d)(h-e)}{(b-a)(b-c)(b-d)(b-e)}, z=\frac{(a-h)(c-h)(d-h)(e-h)}{(b-a)(c-a)(d-a)(e-a)},$$

$$u=\frac{(a-h)(b-h)(c-h)(e-h)}{(a-d)(b-d)(c-d)(e-d)}, \text{ and } w=\frac{(a-h)(b-h)(c-h)(d-h)}{(a-e)(b-e)(c-e)(d-e)}$$

Solved in a similar manner by *G. B. M. ZERR.*

152. Proposed by G. B. M. ZERR, A. M., Ph. D., Professor of Chemistry and Physics in The Temple College, Philadelphia, Pa.

Solve by a short original method, if possible: